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‘Sexual Selection, Automata and Ethics in George Eliot’s *The Mill on the Floss* and Olive Schreiner’s *Undine* and *From Man to Man*’¹

For all its breadth and ambition, the nineteenth-century novel seldom strayed far from its meticulous charting of the processes of sexual selection.² These processes characterise the period of courtship, that crucial period central to the narrative construction of bourgeois femininity as a marriage project. By the end of the century, and the Victorian era, the novel was also one of the places in which the limitations of that project were coming under increased critical scrutiny and censure. Through the final decades of the century, sexual selection concurrently became the topic of systematic scientific discussion which brought courtship plots into new contexts. These included warmly disputed ideas about females as sexual choosers: Alfred Russel Wallace and St George Mivart, for example, were staunch opponents of Charles Darwin’s central contention that females exert selective pressure through their mating choices, Mivart insisting that the ‘instability of a vicious feminine caprice’ could never provide the constancy required for lasting evolutionary influence.³ These debates also helped to consolidate a newly inflected sense of the meaning of inheritance. The importance of family name, rank and wealth – all central to the marriage plots of the novels of Jane Austen, for example – were superseded by questions of biological inheritance, of what mothers and fathers pass to their offspring in the puzzlingly opaque processes of physical, mental and moral reproduction.

Such scientific debate – energised, though certainly not initiated, by the publication in 1871 of Darwin’s *The Descent of Man, and Selection in Relation to Sex* – was part of the growing authority and reach of scientific naturalism in the second half of the century. At the end of *Origin of Species*, Darwin briefly notes that evolution holds the key to the most important forms of understanding about human beings, including the complexities of mind.⁴ The extension of scientific method to human mind and motivation which constituted the new psychology and which, in the hands of writers such as Herbert Spencer and Darwin himself, married physiology

and evolutionary biology, proved to be one of the most potent domains for transformations associated with secularization. The classification and study of ‘emotions’, for example, began to replace older, and Christian connoted, concepts of passions and affections.⁵ The philosopher Henry Sidgwick, writing in 1874, declared that scientific method was rolling back uncertainty in all ‘departments of facts’: ‘conflicting modes of thought have receded and faded, until at length they have vanished everywhere, except for the mysterious citadel of the will.’⁶ For some, like Sidgwick, the exercise of a mysterious ‘I’, the basis of formed ethical will, is what most clearly distinguishes humans from other species, but this was a distinction that evolutionary thinking was rendering increasingly fragile. For Darwin in the *Descent*, ethical or socially responsible behaviour is the product of evolutionary forces, and not an instance of the special human privileges and burdens endowed by a divine creator. But this biological account raised its own problems in relation to a modern yearning for freedom and self-fulfilment that was particularly sharply felt by women seeking to transform traditional gendered expectations about their lives. It is in novels that this tension is most tellingly explored.

From the 1870s on, Sidgwick’s ‘mysterious’ human will and the moral capacities with which it is associated came under direct attack from the new physiological understanding of mind. Volitional consciousness itself came to be seen as a metaphysical fiction in theories which threatened to collapse long-held assumptions about self and consciousness, motive and action. Delivering the Gifford lectures in Aberdeen between 1896 and 1898, the philosopher and psychologist James Ward characterised scientific naturalism as the union of three fundamental theories: the first two assert that nature is ultimately resolvable into a single vast mechanism and that evolution describes the functioning of this mechanism; the third is the ‘theory of psychophysical parallelism or conscious automatism, according to which theory mental phenomena occasionally accompany but never determine the movements and interactions of the material world.’⁷ One famous exponent of this latter plank of scientific naturalism was Thomas Henry Huxley who in 1874 published in the *Fortnightly Review* his essay ‘On the Hypothesis that Animals are Automata, and its History’. In it, he argues that consciousness is merely a non-causal accompaniment to physiological life: the conscious mind is the steam whistle which announces, but does not drive, the locomotive engine of the brain.⁸ Darwin, on reading the article when it was later reprinted, wrote to John Collier: ‘That on automatism is wonderfully

interesting, more is the pity, say I, for if I were as well armed as Huxley I would challenge him to a duel on this subject. But I am a deal too wise to do anything of the kind, for he would run me through the body half a dozen times with his sharp and polished rapier before I knew where I was.’⁹ The duel was fought many times amongst others, however, over the profound implications of automatism theory for cherished notions of the human, of free will, and the liberal subject.

Implicitly and explicitly these scientific debates could not fail to be important for women novelists exploring narratives of sexual choice in the period, as they sought to understand the ethical implications of courtship for middle-class women and to imagine new forms of female agency and autonomy. After all, at its most explicit, the evolutionary account of sexual selection told by Darwin appeared to offer women a very limited set of imaginative possibilities. In the *Descent* evolutionary biology seems all too readily to mirror middle-class Victorian gender stereotype: ‘Man is more courageous, pugnacious and energetic than woman, and has a more inventive genius’, while woman displays ‘greater tenderness and less selfishness... owing to her maternal instincts’.¹⁰ As a result, female commentators from the period, and feminist scholars subsequently, have viewed Darwin’s work, and sometimes late nineteenth-century biological science as such, as largely hostile to women’s egalitarian aspirations.¹¹ But few thoughtful commentators see Darwin’s influence as straightforward. Recently, for example, the literary Darwinian scholar, George Levine, has sought to retrieve the ‘fertile and disruptive’ potential of Darwin’s theory of sexual selection, arguing that Darwin’s theory works counter to the cultural forces which produced it by ushering intention back into the evolutionary world. This is not intention on the grand plan of natural theology’s divine originator, but is rather the result of the agency practiced by females in their sexual choosing.¹² Certainly it is true that over-hasty assessments of the impact of evolutionary and scientific ideas risk not only misunderstanding Darwin’s influence, but also misreading the complex lines of influence running between literary and scientific writing in the period.¹³ Thus Ruth Bernard Yeazell, in her study of courtship in the novel, is rightly convinced that the ‘modern understanding of the natural’ which functioned to secure so much of the codification of female modest behaviour in the nineteenth century ‘owes at least something’ to the work of novelists.¹⁴ Similarly, in their introduction to the *Descent of Man*, James Moore and Adrian Desmond endorse Kenan Malik’s contention that: ‘Darwinian man... was not manufactured by Darwinian theory. He already existed in Victorian culture, whether in

the theories of Herbert Spencer and Henry Maine, or in the novels of Emile Zola and George Eliot. What Darwinism did was to give him a scientific cloak.’¹⁵

In the remainder of this essay, I look at how increasingly authoritative scientific accounts of human motive and behaviour affected two women novelists, George Eliot and Olive Schreiner. The novels I look at here span the final four decades of the century, a period in which scientific naturalism, and especially evolution, gained great authority. Giving Darwinian man a ‘scientific cloak’ undoubtedly had real effects for the position of women – as indeed it did for courtship plots. By the 1890s, for instance, New Woman novelists were bestsellers. In the hands of writers such as Sarah Grand courtship plots were made exemplary of the social responsibilities of middle-class women. As eugenic ideas began to find wider assent, romantic love was imagined as a rational process of mate-choosing, and courtship reconceived as central to stemming national biological deterioration.¹⁶ At the same time, the tone of the novel became more urgent and didactic, in part as a response to this increasingly dogmatic scientific reductionism. One of the things we might expect, then, from bringing together Eliot and Schreiner, is a sense of the narrowing or hardening of available imaginative possibilities for women novelists engaged with scientific ideas. In this sense, Eliot’s *Middlemarch* might be seen to represent the most fruitful moment in which deterministic science can be opened out by the novelist’s skill.

But I bring Eliot and Schreiner together here to suggest that there are also important continuities across the period. Both writers explore sexual relations as a particularly sensitive barometer of ethical life, and both see ethics as fundamentally about relations and relationship. Relations, in this ethical model, cannot be fixed, and are subject to the endless transformations of perception, time and context. As active participants in the cultural assimilation of scientific ideas, as well as enthusiasts for the progressive potential of such ideas, Eliot and Schreiner nevertheless know that deterministic models of human well-being cannot work. In their fictions, the effects of determinism are deathly. Their writing also, in rather different ways, serves as a reminder of the persistence and continuity, especially within the developing languages of psychology, of older moral, ethical and religious contents. As we will see, these contents animate the new sciences – and courtship plots - in sometimes surprising ways, as part of the complex and often opaque processes of secularization.

Laws of Sexual Choosing in The Mill on the Floss

George Eliot was famously underwhelmed on first reading Darwin's *Origin of Species* which appeared as she was writing *The Mill on the Floss*.¹⁷ But for a reader keen to test Kenan Malik's contention that 'Darwinian man' already existed in the novels of writers such as Eliot, what is striking is that it is Darwin's much later book, the *Descent of Man*, which Eliot's most autobiographical novel seems strikingly to prefigure. Angelique Richardson has pointed to the *Mill*'s fascination with heredity, though doubtless Mr Tulliver would have remained confused about the topsy-turvy world where 'a pleasant sort o' soft woman may go on breeding you stupid lads and 'cute wenches' even had he had the benefit of Darwin's own grappling with the problem of how parents pass on their distinctive traits.¹⁸ But Mr Tulliver was certainly not alone in feeling puzzled about the workings of biological heredity. Well before the appearance of Darwin's work, the processes by which qualities were transmitted from one generation to another perplexed commentators who, nevertheless, were increasingly emphatic about the importance of such processes - especially for those considering courtship and marriage.¹⁹

These were debates which would have been familiar to Eliot. For example, writing in 1856 for the *Westminster Review*, on 'Hereditary Influence, Animal and Human', her partner George Henry Lewes was able confidently to assert that 'Constancy in the transmission of structure and character from parent to offspring, is a law of Nature.'²⁰ Lewes was contributing to an already extensive literature (especially in medicine and amongst stock-breeders and horticulturalists) which sought to demonstrate the importance of biological heredity in mating choices. Amongst early influential works, Alexander Walker's 1838 *Intermarriage* argued for a 'new science' that could identify and explain natural laws determining 'the precise forms and qualities' of offspring and which could, as a result, predict with certainty the relative health and intellect or deformity and disease resulting from a given sexual union.²¹ Walker insists that '*in the propagation of organs from parents to children, organization is nearly indestructible*' [italics in the original] and, as a consequence, that environment and upbringing cannot substantially diminish the original resemblance to a parent. He also believes that 'an instinctive feeling of suitableness' will generally guide mate-selection.²² Writing in 1853, *On the Management and Disorders of Infancy and Childhood*, Thomas J. Graham is less certain, warning that only by conscious attention to

‘the law of selection’, could the ‘disastrous consequences of improper intermarriages ... be avoided.’²³ In particular, Graham sees marriage amongst close relations as ‘exceedingly imprudent’, intensifying the risks of inherited disease. Although his argument draws heavily on Walker, recommending for example, the seeking of ‘opposite’ qualities and temperament in a mate (‘the dry are recommended to seek the humid in marriage, and the meagre, the plump’²⁴), his emphasis is on man’s capacity to control or affect ‘selection’: ‘man has unquestionably some power to reproduce and to preserve the best... portion of his organization.’²⁵ Darwin’s elaboration of the mechanisms of evolutionary selection helped Francis Galton to outline his own more famous ideas about the importance of heredity for national and racial improvement in essays for *Macmillan’s Magazine* in the 1860s, and in his 1869 *Hereditary Genius*. A decade and a half later, in 1883, he coined the term ‘eugenics’ to describe ‘the science of improving stock’.²⁶ Biological heredity as a result began to be seen as important in relation to populations and nations, rather than simply individuals and families.

In contrast to Mr Tulliver’s confusion about these matters in *The Mill on the Floss*, an almost ruthless clarity about the relation between desire, heredity and reproductive promise seems to drive Maggie Tulliver’s love plot. Eliot makes us know that Philip Wakem, Maggie’s sensitive, morally intelligent would-be lover, is not physically deformed through heredity, but merely through childhood accident. In doing so, she implicitly challenges Mr Tulliver’s assumption of the continuity of temperament between father and son.²⁷ Nevertheless, Philip’s un-fitness as the tall and beautiful Maggie’s mate is drawn relentlessly in terms of their physical difference, their mis-match as mating partners. His deformity takes on the resonance of hereditary taint, as if his crooked back echoes his father’s crippling of Mr Tulliver. None of Philip’s sensitivity, his literary insightfulness, his human wisdom can counter this fact of his sexual and reproductive un-fitness, violently articulated by Tom as he asks of Philip: ‘Who wouldn’t laugh at the idea of *your* turning lover to a fine girl?’ But Tom’s outrage is also underscored in Maggie’s own chill shiver at hearing cousin Lucy’s imagined ‘pretty ending’ of Maggie’s courtship story in marriage to Philip (*Mill*, 359, 403).

The sixth book of *The Mill on the Floss* is introduced in the quasi-religious language of ‘The Great Temptation’. The fact that it will be about sexual choosing is made explicit in opening

with Stephen Guest's complacent pleasure at finding in Lucy Deane 'quite the right sort of wife... the wife who was likely to make him happy' (385). He is gratified that he is unswayed by those 'indirect considerations', such as 'mere wealth or rank', that Darwin will nevertheless assert do play an important part in civilised man's choice of marriage partner (*Descent*, 688). Lucy is pretty, accomplished, gentle, affectionate and not stupid: much the qualities Darwin himself valued in 1838 when picturing to himself 'a nice soft wife on a sofa' and deciding, on balance, to marry.²⁸ Maggie Tulliver is a different kind of woman who, by virtue of her beauty – but also her oddness and her cleverness – gets to do some sexual selection of her own. The battle for her attention begins in relation to a favoured marker of male sexual competition in *The Descent of Man*: music and singing. The vocal cords, Darwin insists, are 'primarily used and perfected in relation to the propagation of the species'; while the relative power and deepness of men's voices is explicitly selective, being the effect of 'the long-continued use of the vocal organs by the male under the excitement of love, rage and jealousy' (*Descent*, 632). I will shortly return to the more obviously moral connotations of this musical encounter. However, it is worth noting that Eliot would have been familiar with an evolutionary account of music. Herbert Spencer published such an account in 1857 (albeit reaching different conclusions from Darwin's), and both he and Lewes were interested in music as an exemplary instance of involuntary physical response.²⁹ In Eliot's version of the language of music, Philip Wakem's 'pleading tenor' declares to Maggie 'I love thee still', but is cut off by the 'saucy energy' of Stephen's bass, its 'deep "brum-brum" very pleasant to hear'. Maggie's beauty is intensified to onlookers as she is played on 'by the inexorable power of sound', making her 'strong for all enjoyment, weak for all resistance'. Philip feels that 'he had never before seen her under so strong an influence', and, as Stephen's song makes 'all the air in the room alive with a new influence', she 'was borne along by a wave too strong for her' (434-5).

Maggie will once again be borne along by the tide - before the final flood which brings her death. In place of Lucy's carefully contrived boat trip for Maggie and Philip, it is Stephen Guest who leads Maggie, with 'firm tender care', exerting his 'stronger presence that seemed to bear her along without any act of her own will', into the boat which he will then row, 'half-automatically,' beyond the limits of Luckreth (where they were due to disembark), St Oggs and respectability (484). Maggie has no resistance, her 'languid energy' is absorbed by the happiness

of being with him, as she gives herself over to his capable strength (488). The dream which brings her back to consciousness (and conscience) after a night spent together on the river, ushers in 'her own memory and her own dread' (491). In the long trial of her parting from Stephen, both evoke law. Stephen insists on '[t]hat natural law [which] surmounts every other...we can't help what it clashes with', later elaborating with: 'There is nothing in the past that can annul our right to each other – it is the first time we have either of us loved with our whole heart and soul' (495, 497). Maggie counters with another, more tremulous law, of memory and the ties that bind us to the past, of family bonds, emotional investments and the 'divine voice within' (498). When, eventually, she walks away from Stephen, 'it was like an automatic action that fulfils a forgotten intention' (500).

If Stephen Guest evokes the power and rightness (the 'natural law') of good sexual selection – arguing that 'it would be hateful – horrible to think of your ever being Philip's wife' (497) – Maggie Tulliver's answer is no less central to the account of the evolution of man which Darwin offered a decade later. For, while Darwin admits that the 'highest part of man's nature' is complexly developed through 'the effects of habit, the reasoning powers, instruction, religion &c', he nevertheless sees the foundation of the moral sense as lying in the social instincts which are indisputably a product of natural selection (*Descent*, 682). Maggie knows that she 'couldn't live in peace' with Stephen, and that, given a second chance, she 'would choose to be true to my calmer affections and live without the joy of love' (*Mill*, 497). Darwin writes, in the 'General Summary and Conclusion' of *Descent*: 'after some temporary desire or passion has mastered [man's] social instincts, he reflects and compares the now weakened impression of such past impulses with the ever-present social instincts; and then he feels that sense of dissatisfaction which all unsatisfied instincts leave behind them [and] resolves to act differently for the future – and this is conscience' (680). For Darwin, those actions originally conducive to group bonding become deeply ingrained – in part because of their selective advantage to the group – in the hereditary material. In *The Mill on the Floss* it is as if Eliot is already presenting her characters' actions as stemming from their biology. Maggie acts initially during the boat trip with Stephen as if driven by something (Stephen's 'natural law' of mutual attraction and love) which bypasses or overrides will; subsequently, as she leaves Stephen, she also acts 'automatically'. It is as if conscious will still has no place amidst the instincts which drive her, even if these have changed

to those social instincts that Darwin will also characterise as the calmer and more persistent ones.³⁰

‘Darwinian man’ is indeed present in the pages of *The Mill on the Floss*. It is a figure crafted, most certainly, from Eliot’s engagement in scientific and philosophic discussions centred on the *Westminster Review* over the 1850s where, broadly, the ‘Development Hypothesis’ was accepted. But amidst a scientific environment striving to identify repeatable, generalisable laws, one increasingly dominated by naturalist reductionism, the novelist Eliot cannot help but demonstrate that authentic moral life is not a matter of abstract ethical notions. Instead, it is an ongoing process of intense, embodied and enworlded negotiation, which has to struggle with its lived contexts and, along the way, with rights and necessities, self and object.³¹ Thus, Maggie’s ‘unwilled’ and automatic actions are only part of her response to the crisis she and Stephen face. Maggie does exert her will (‘She had made up her mind to suffer’ (495)), and is motivated by the workings of both her mind and her feelings: ‘I have never consented [to being with Stephen] with my whole mind... I know – I feel... I don’t know what is wise – but my heart will not let me do it’ (497, 499). Unpicking the complex interplay of instinct, will, mind and feeling – experienced as dream, conscience, duty, affection, memory and religious feeling – and establishing causal hierarchies was a central task for the new psychology which developed from the mid century.³² But there can be no narrative resolution for Maggie on the lines, for example, of Herbert Spencer’s account of the shaping influence of mental faculties and habits over time. For Spencer, the laws of evolutionary movement dictate that inner relations of mind must be determined by the outer relations of environment: individual interests must be identical to those of the social organism.³³ For Maggie, by contrast, hampered by an external environment dully (and ideologically) resistant to her curiosity and intelligence, and an internal clash of desires and affections, there is only irresolvable conflict. The dynamic conflicts of the novel exceed the parameters of scientific theory, just as the novel’s culminating flood breaches the rules of Eliot’s novelistic realism to end the novel in ‘symbolic outcry.’³⁴

In part such conflicts must be seen in relation to the burdens of autobiography that Maggie and the novel carry. The Tulliver siblings’ romantic reunion-in-death poignantly recasts what, for Eliot, could not be repaired of the ruptured family relations caused by her rejection of orthodox

Christianity and her decision to live with an already-married man. Her brother, Isaac, remained obstinately unforgiving even through the crisis of their sister, Chrissey's, illness and her death in March 1859. But Maggie's narrative – including those parts which evoke John Stuart Mill's 1869 *On the Subjection of Women* more sharply than they do Darwin³⁵ – also resonates with Eliot's more immediate concerns about publication decisions for her new novel following the critical and commercial success of *Adam Bede*. Ostracised by her own family and illegitimately associated with another (which made considerable financial demands on her married partner, Lewes), Eliot needed financial security – as well as the self-affirmation afforded by literary celebrity. As a consequence, she was condemned by some for a disposition 'inordinately greedy'.³⁶ The human relations already established with her publisher, John Blackwood (actively nurtured in Blackwood's canny gift to his best-selling author of a pug puppy to which Eliot and Lewes both became strongly attached), play out, in minor key, themes of family, loyalty, and commitment. But for Eliot, as for Maggie, the individual is inordinately vulnerable if rejected by the social organism in which it is meant to fit. Eliot's was a society where double standards for women and men kept her at home, uninvited to the social gatherings open to her partner, Lewes. Eventually resolving her disagreements with Blackwood, and agreeing to terms for the publication of *Mill on the Floss*, Eliot told him: 'I prefer, in every sense, permanent relations to shifting ones.'³⁷ Her own life, as well as the story of Maggie's, testifies to the tremendous difficulty of such commitments in mid-Victorian society for very clever, ambitious and thoughtful women.

Olive Schreiner confessed to her friend, Havelock Ellis, that on rereading *The Mill on the Floss* she felt suffocated by 'that great relentless wave of Duty'.³⁸ For both of these freethinking women authors, Eliot and Schreiner, ideas of 'Duty' remained powerfully shadowed by their early evangelical enthusiasms. Thus, while Gordon Haight notes that the otherwise autobiographically-drawn Maggie Tulliver does not share her author's youthful interest in evangelicalism, shaping fragments of that rejected religious sensibility remain to colour the story of Maggie's motivations.³⁹ In one sense, indeed, Maggie is an exemplary evangelical subject precisely because she must constantly interrogate her motives and actions. According to evangelical doctrine, the outwardly good may be more imperilled, because complacent about the 'signs' of their external actions, than those who continually struggle with evidence of their

sinfulness. These latter know that they need God. It is lack of faith which is the real danger, and the faithless who are condemned to hell.⁴⁰ More sharply, Delia de Sousa Cornea has argued that the musical repertoire associated with Stephen Guest includes music Eliot herself condemned during her evangelical youth.⁴¹ The music which seduces Maggie would not have worked on her puritan-minded author at a similar age, or on any well-educated young lady. Maggie, as the first parts of the *Mill on the Floss* emphatically demonstrate, is *not* well educated. Her spontaneous and physical response to music is repeated in her response to Stephen himself: both disable will and moral choice, and lay the female protagonist open to devastating consequences. Duty, in the evangelical mode, must become infused with the passions that otherwise fuel self-gratification and thus tempt and blight a life.⁴²

Some contemporary critics failed to understand this and were exasperated by the love plot of *Mill on the Floss*, especially Maggie's 'mere outside fancy for the good-looking, sweet-voiced cox-comb, Stephen Guest'. The idea of a woman of 'Maggie Tulliver's kind' acting as she does is 'astonishing and revolting' to Swinburne; and Leslie Stephen describes it as 'simply indefensible', suggesting that even if we can suppose that 'the imagination of an impulsive girl may transfigure a very second-rate tradesman into a lover worthy of her', it is inexcusable that Eliot appears to share the illusion.⁴³ But, as we have just seen, Eliot surely does not. Indeed, she explicitly signals, in one of the earliest instances of Stephen's desiring attention, that Maggie responds as she does because it is the poorly educated woman's script so to do. The self-confident man who solicitously places a footstool and enquires about the draught: 'these things will summon a little of the too ready, traitorous tenderness into a woman's eyes, compelled as she is in her girlish time to learn her life-lessons in very trivial language' (436). How, in the environment of St Oggs, could Maggie possibly lead a flourishing life? Her fate suggests that the language of female life-lessons is badly in need of expansion and enrichment, and there is little to suggest confidence in this regard in deterministic accounts of human motivation. Responding to criticism of Maggie's behaviour from Sir Edward Bulwer Lytton, Eliot insists that the ethics of art must be wide enough to encompass Maggie in her 'great error'. If they are not, they must be 'widened to correspond with a widening psychology.'⁴⁴ Psychology was indeed a burgeoning part of the new science but, as I go on to demonstrate in the next section, was not inevitably expansive *or* progressive.

Huxley and Conscious Automata

Writing to her friend Barbara Bodichon Eliot confessed that, honest and brave though the account of evolution might be, explanations of ‘how things come to be’ produced in her only ‘a feeble impression compared to the mystery that lies under the processes.’⁴⁵ By the 1870s, the mysteries of consciousness itself were being subjected to concerted scientific scrutiny and, while Henry Sidgwick remained convinced that, despite the ‘formidable array of cumulative evidence’ for determinism, thoughtful human beings could be confident of the ‘immediate affirmation of consciousness in the moment of deliberate action’,⁴⁶ some of the most powerful voices of the scientific community asserted the contrary. Ideas about the physiological basis of action drew from the work begun in the 1830s by Marshall Hall who argued, as part of his theory of reflex action, that sensory-motor actions such as sneezing are carried out independently of consciousness. A decade later, Thomas Laycock extended the scope of Hall’s physiological model to include the higher functions of the brain. From the 1870s such physiological work was developed more systematically. In his 1874 article on reflex systems and mental functioning, ‘On the Hypothesis that Animals are Automata, and its History’, Huxley argues that ‘our mental conditions are simply the symbols in consciousness of the changes which takes [sic] place automatically in the organism’, concluding that: ‘We are conscious automata, endowed with free will in the only intelligible sense of that much-abused term – inasmuch as in many respects we are able to do as we like – but none the less we are parts of the great series of causes and effects which, in unbroken continuity, composes that which is, and has been, and shall be – the sum of existence.’⁴⁷

Thoughts and emotions, as much as sensations, are the result of physical processes in the brain which the conscious self expresses but does not motivate or control. Disputes about ‘automatism’ theory rumbled on through the remaining decades of the century, with important naturalist opponents such as William Carpenter.⁴⁸ William James, writing in *The Principles of Psychology* in 1890, argued that the ‘automatists’ fly in the face of both common sense (‘common-sense... has the root and gist of the truth in her hands when she obstinately holds to it that feelings and ideas are causes’) and of the fundamental principles of evolutionary selection: something as complex as consciousness could never have evolved if it did not advantage an organism.

Consciousness is undeniably *useful*, James asserts: ‘But, if it is useful, it must be so through its causal efficaciousness’.⁴⁹ There were other objections too, from those who saw the machine-like body/brain imagined by the scientific naturalists as a chilling counterpart to Carlyle’s lasting nightmare vision of modern man grown mechanical in head and heart.⁵⁰ These, usually religious, opponents railed against the ‘eminent atomic, molecular chiefs’ of the secular and scientific world.⁵¹ Their anticipated accusations are the subject of the closing sections of Huxley’s essay where he rehearses the charges of fatalism, materialism and atheism he anticipates will be levelled against him and dismisses them as unfounded. He goes so far as provocatively to assert that his thesis finds ample prior support in a major Protestant tradition: ‘It is held, for example, in substance, by the whole school of predestinarian theologians, typified by St Augustine, Calvin, and Jonathan Edwards – the great work of the latter on the will showing in this, as in other cases, that the growth of physical science has introduced no new difficulty of principle into theological problems, but has merely given visible body, as it were, to those already existed.’⁵²

Huxley’s claim deserves to be taken seriously. It is not only novelists whose accounts of the workings of human motivation are shaped by consciously abandoned religious belief. Adrian Desmond’s 1997 biography of Huxley, for example, emphasises throughout – not least in its subtitles, ‘The Devil’s Disciple’ and ‘Evolution’s High Priest’ - how Huxley’s science was metaphorically and rhetorically permeated by religion, and emotionally shaped by Dissent. Christopher Herbert has written about the persistent effects of evangelical religion, especially Wesleyanism, on social theory of the nineteenth century. From the sacralizing of culture and society, to the renunciation of individual will and desire central to internalised modern discipline, Herbert sees the secularised imprint of the doctrine of original sin. For Wesley, humans are ‘altogether corrupt in every power and faculty’; their desires are illimitable and must be subject to constant surveillance and discipline. The will of God is supreme, and ‘our one rule of action in everything, great and small’. Thus, for Matthew Arnold, the puritan’s goal is to construct ‘a network of prescriptions to enwrap his whole life, to govern every moment of it, every impulse, every action’.⁵³ Modern ideas of freedom and individuality, of unrestricted liberties, are in this view cast as bondage to unfocused, unbounded and insatiable desires, producing a condition of restlessness and endless instability (the condition of original sin).⁵⁴ For Huxley, Calvinism lends affective authority to the evolutionary mind being imagined by the 1870s. It is not free, but a

product of physiological law. Desmond describes it as belonging to a 'passionless cosmos reflected in an impersonal laboratory'.⁵⁵

Determinism, Sexual Selection and Olive Schreiner

In the final part of this paper I turn to Olive Schreiner's literary negotiation of forms of determinism, both religious and scientific. I start earlier than is usual in looking at Schreiner's work, however, with her first completed novel, *Undine*, which Schreiner began around 1873 while living at the northern Cape's recently discovered Diamond Fields. It was finished at the beginning of 1876 while she worked as a governess on Boer farms in the Karoo region of the Colony. Schreiner quickly decided against trying to publish the book, instead re-using some of *Undine*'s material for a further novel which made her literary reputation when it eventually appeared in 1883 as *The Story of an African Farm*. Writing to Havelock Ellis in 1884, after she had moved to England, Schreiner claimed she could barely remember *Undine*: 'I ought to have burnt it long ago, but the biographical element made me soft to it.'⁵⁶ Ellis, then in love with Schreiner, was fascinated by its autobiographic contents but clear about its artistic limitations. Finishing reading it, he wrote: 'There is scarcely a single instance of that concentrated energy of expression which I regard as characteristic of you... The magnitude of the step to *S[tory of an]A[frican] F[arm]* is quite wonderful.'⁵⁷ After her death in 1920, Ellis passed the manuscript to Schreiner's husband and literary executor, Samuel Cronwright, who published it in 1929.

Although it can conventionally be read as a narrative of the rejection of religious faith and turn to freethought – one of its framing debates is the predestinarian theology to which Huxley refers – *Undine* is also a startling representation of automaton-like sexual constancy, in which the central protagonist's intellectual capacity simply dissolves when she falls in love. It is clearly an attempt by Schreiner to fictionalise her own conversion experience: including, centrally, the development of a thoroughgoing critique of evangelical (and Wesleyan) Christianity, but also, more fragmentarily, a critique of social power and, especially, the position of women. While the former is affectively vivid, however, and characterised as a shatteringly painful process of conflict and loss, the latter is peculiarly abstract and passionless. Undine may have discovered truth in ideas associated with secularising modernity, but that truth is a pale thing which seemingly cannot survive the force of falling in love. The problem of sexual selection, for the

female protagonist, is not so much that desire gets the better of will, but that both appear programmed and unmodifiable.

Undine begins with an account of ‘a queer little child’, marginalised within a hybrid English and Dutch farming home in South Africa, and plagued by the sense of an inexorable and cruel God presiding over a world of overwhelming human misery. Undine’s misery stems from the conflict she feels about the morality of a God who condemns the sinners he has created. Sent to her room with no dinner, for an outburst during Sunday study in which she asserts that the real lesson of Matthew 25 is ‘That God has prepared a heaven for the people he means to save and a hell for the people he means to burn’, Undine consoles herself by reading.⁵⁸ She does not choose the ‘delicious fairy tales’, *Arabian Nights* and Hans Anderson, however, because it ‘would have hurt the child’s conscience as much to have read a fairy tale on Sunday as to have told a lie’ (18). Instead, she reads from ‘*A Careful and Strict Enquiry into the Modern Prevailing Notions of the Freedom of Will, which is supposed to be essential to Moral Agency, Virtue and Vice, Reward and Punishment, Praise and Blame, by Jonathan Edwards, A.B.*’ This book Undine has hidden because ‘They would have laughed at her for reading such an old man’s book and one with so grandiloquent and lengthy a title’ (19).

Edwards was a key figure in the New England revivalist movement of the late 1730s and the 1740s known as the Great Awakening, and responsible, in the 1754 *Freedom of Will*, for revitalising Calvinist tenets against Arminianism.⁵⁹ Named after the Dutch theologian Jacob Arminius, the latter was a set of protests against ultra-Calvinism begun in Holland in the early seventeenth century which were widely popular in the New England colonies. Arminianism sought to moderate the Calvinist doctrine of predestination, and especially the concept of supralapsarianism – the idea that the fall of man was always already a determined necessity, the result of a prior and positive decree by God. In particular, it sought to ground moral responsibility – and therefore the attribution of praise or blame - in the free will of the individual. Much of Edwards’ work on the will was devoted to finding an argument which could establish that humans are responsible for their actions *despite* the fact that their fundamental goodness or sinfulness is ultimately the product of God’s decree.⁶⁰ He makes use of a distinction between ‘will’ and ‘person’, asserting that the latter does indeed have the opportunity to act (and is

therefore responsible for those actions); the notion of a self-originating will is, by contrast, incoherent because it must be presumed to be independent of any prior conditions of determination. A free act, according to Edwards, cannot be explained except by reference to another free act which precedes it, and so on into infinite regress. In fact, what actually exists instead of this nonsensical regress is human inclination towards good or evil which is entirely the product of God's will and decree.⁶¹ Edwards thus effectively insists that religious determinism does not vitiate moral responsibility and can, on this score, be justified against its anti-Calvinist critics; just as, for Huxley, understanding humans as physiological machines, and consciousness as epiphenomenal, does not extinguish free will understood as the ability to 'in many respects do as we like.'⁶²

Undine reads carefully and slowly sections of the book which concern the moral conduct of Jesus Christ, as exhibited in his human nature. They argue for the inevitability of Christ's actions being holy and agreeable to God's will. Undine reads only a small amount, 'for each sentence was found so pregnant with profound and misty thoughts that she was obliged to read it carefully, and often re-read it, before it could be dismissed' (19). The key passage is one in which Edwards argues that the salvation of all the saints from the beginning of the world, and the faith of the Old Testament patriarchs, is based on the redemption of the coming Messiah. Thus, if that (human) Messiah could fail, salvation has no firm foundation and all of Christianity collapses because built on uncertainty.⁶³ The human Christ is thus, inevitably, *determined*: his sin is impossible because foundational of the entire faith.

We have only minimal narrative guidance about how to interpret this act of reading. The narrator comments on the contrast between the child, full of life and vitality, and the 'great brown book' she is reading: 'the book so old, so dead, with the life thoughts of another generation petrified in its old yellow leaves, now probably being read for the last time' (19). At one level, this allows us simply to read the episode as part of the development of Undine's freethought: in due Comtean manner, the phase of religious belief and the controversy with which it is associated, now old and dead, will be replaced by science and positive knowledge. The seemingly arcane debate about free will and determinism recedes as the lonely child discovers a new set of ideas – in the form of more books – that make her a freethinker. Though she has not yet found these new books, she

is already on her way, her careful, thorough reading of Edwards' text showing her commitment to appropriately rigorous method in her pursuit of truth. We are given one further fragment of information about this scene, however, in which we are told that 'The book had belonged to [Undine's] own father, who, much to the grief of his father, had turned aside from the paths of truth and Arminianism, to the ways of Calvinism and error, and in those evil ways had died' (19). Undine thus reads the book which stands for her father's heresy as she begins to formulate her own. Fleeting, we are returned to the family drama which accompanies conversion, and reminded of its psychic costs. Undine's careful and thoughtful dismissal of what she reads cannot escape those costs; she cannot be rid of the dead book so easily. Its argument, about the fiction of free will or liberty and the reality of determinism, returns, transformed. As she grows up, the world is seemingly made more bearable for Undine by the new books she discovers - especially those of John Stuart Mill and Herbert Spencer. But, faced with shocking human loss she cannot make this reading answer to the problem of the afterlife. Thereafter, an unresolved determinism returns to the narrative, no longer as a question of religious faith and doubt, but in relation to the issue of sexual selection and sexual love - and it turns out to be every bit as punitive and morally repellent as Undine's experience of theology.

In the second chapter, Undine is 16 years old and living with her maternal grandparents in England where her brother dies by drowning, sending his fiancée mad with grief. Undine's own recovery from this event, staying with other relatives in an idealised rural England (Schreiner knew England only from books at this point), with Mill's and Spencer's books for companions, is only partial: 'The impression those days had made upon her, extinguishing all hope, all faith, all trust, had somewhat faded, but a strange deadness seemed to have settled down upon her; and, with an intellect vigorous and alive, it seemed as though all emotional vitality had died within her' (64). Although she has developed a sharply feminist critique of the men she encounters, she nevertheless laments her own coldness and indifference, intuiting that only love can save her: 'If only I could love something, she thought, as she passed slowly over the wet grass. To love something, to believe in something, to worship something, even if that something were only herself - to look at something with eyes other than those of calm indifference - it would be worth sleepless nights of tears and prayer' (65). She is soon to have her wish. The object of her love is Albert, the eldest son of the wealthy and repellent George Blair. The narrative, though, gives us

precious little – almost nothing indeed – to support Undine’s love for him: he is arrogant, cold, with ‘disagreeable eyes’, passing ‘commonplace conventional remarks’ on the paintings they view, and concerned that Undine conform to the duller version of feminine propriety (68). All we have to make sense of what transpires is Undine’s implied sexual desire that strips her of will, certainly, and also of intellect. Thus, meeting Albert Blair unexpectedly during a walk, and seeing him look askance at the book she has been reading – which is unidentified, but by implication is one of Undine’s favoured volumes, such as Mill’s *Logic*, provoking Blair to comment, ‘Rather stiff reading, I should imagine’ – she returns home and pulls out its pages, burning them one by one: “‘I must be going mad,’” she said. “‘What makes me do this, and take such pleasure in doing it?’” (83).

Whatever the pleasure of Undine’s love for Albert Blair, it cannot be integrated with her willed and independent reading and thought, or her nascent feminism. Instead, rejected by Blair (who marries a wealthy woman), she spirals through repulsive forms of sexual self-abnegation and into economic vulnerability on returning to South Africa and the Diamond Fields.⁶⁴ Here, as she makes a parlous living ironing, the notable emotional points of her existence conform to, and confirm, traditional feminine ideals of tenderness, nurturing, and self-sacrifice. Eventually, she discovers that Blair and his wife are nearby, but that he has succumbed to fever and died. Stealing out at night-time to look at his body, she knows there is still ‘no room for her’ in ‘those sternly folded arms’, and cries out ‘as of one whose last hope is past away’ (228). Undine herself dies at dawn when, despite an atoning passage on the organic unity suggested to her by the stars, her last fleeting fantasy of Albert Blair’s arms around her does little to suggest anything redemptive about her automata-like love for him. Instead, we are left with a final, disturbing, image of masculinity: ‘Her white kappie lay near her and cast a grotesque shadow, like a man’s face with long nose and chin... There was nothing else to be seen in the little yard’ (235). Female sexual constancy has become a parody of itself as Undine’s life is leached away in her automata-like love for Albert Blair. The more mechanically she conforms to sacrificial femininity, the more grotesquely she is punished. Her rejection of Calvinistic doctrine, supposedly releasing her into ‘freethought’, instead remains as an ultra-determinism in relation to sexual choice. What Undine cannot do, at any point, is to integrate her intellectual response with her emotional-sexual life.

The human automata supports an instinctual life which, in the Darwinian account, entrenches Victorian feminine stereotypes. Between that and an ethical (evangelical) will that promulgates duty, late-Victorian women found their self-representation badly fractured, with intellect hived off, and at odds with avowedly feminine character. Intellect, the result in Darwin's account of the 'contest of rival males, and...success in the general struggle for life' (*Descent*, 630), is an adaptive by-product of being male. *Punch*'s response to the birth of the 'New Woman' in the mid-1890s press was inevitable: intellect is the refuge of those women who lack the aesthetic qualities favoured by sexually selecting men.⁶⁵ Finding less trivial languages than these for their love plots proved a testing experience for women writers at the end of the nineteenth century, in relation to their emancipatory-minded protagonists.⁶⁶ It is little wonder that the idea of rational love associated with eugenics proved so appealing to many women as sexual selection began to be discussed as an issue of importance to whole populations, rather than merely to individuals and families.⁶⁷ Female virtue recast as eugenic virtue made love choices at the same time moral and the sign not of uncontrollable instinct but of rationally-exercised will.

I want to close, however, not with the problematic attractions of eugenics to women novelists at the end of the century, but with the more complex love plot of Schreiner's final, and unfinished, novel *From Man to Man* (1926). It provides one of the most subtle responses of the period to the complex feminist engagement with the evolutionary account of desiring life, one which steers that evolutionary account in a different direction, contesting as it does fatalism and determinism. *From Man to Man* unusually situates its central woman protagonist in a thoroughly domestic environment. Rebekah lives in a small house in a Cape Town suburb with her husband and children. She has planted a flower garden and its rose hedge is almost always in bloom. She kneads bread, mixes salads in the pantry, makes and mends the children's clothes. She is also a Darwinian naturalist. Like Darwin – if less prodigiously – she is absorbed in the study of nature: cutting galls growing from the mimosa bushes to see if the same types grow on different species of bush; collecting lichens from the roots of the fir trees near her house and the thatch of the roof and from under the rose trees in the garden to compare their differences. A glass cabinet, taken from her room at her parents' home on her marriage, houses her fossils and insects and microscope. Her small study adjoins the children's bedroom, so that she can attend to them if

they awake; its books are mostly old, except for a handsomely leather bound copy of Darwin's *Variation of Plants and Animals under Domestication*.⁶⁸ She is rather more eager than Darwin, though, to think from the natural to the social world.

Indeed, we quickly learn that Rebekah is an informed and passionate advocate of the new scientific view of the world. At the same time, she is its critic, countering the competitive and destructive existence described by social Darwinists with more Darwinism. Illustrating the social nature of the instincts, she recalls a scene in which a male baboon defends its troop of females and young from dogs that tear him to pieces, in a direct echo of the 'heroic little monkey' celebrated by Darwin at the end of the *Descent*.⁶⁹ We also learn that she is deeply unhappy: for what appears to be the domestic harmony represented by her home and its blooming garden actually disguises the torment and humiliation of marriage to a philandering man. Much of the novel's power lies in its complex compromises with the class and racial themes it raises, but my interest here is in the way it brings into view the processes and motivations of Rebekah's sexual passion for her husband, Frank – the intimate experiences of sexual selection - as well as her hard-won but nevertheless intelligent and feelingful decision to relinquish him, and her own love, and thereby establish her life on a new footing.

In the long letter Rebekah writes to her husband after discovering that he is having sex with her young coloured servant, she refers to the casual, day-to-day nature of his desire for other women, a desire which has its own automaton-like quality: 'you have often sat talking with women in the same room with me, bending perhaps over a young girl, plain it might be, with the same passionate light in your eyes begging for a return of sexual feeling, which you once turned on me; not caring that I was present to see, or the glances other women directed to me' (287). That passionate light – the force of the man's sexual desire, and the woman's response - is, Rebekah says, a lure-light, a decoy. It 'leads woman on to surrender and toil and bear for man... Oh, now, even now, when I know what it means, something in me cries out to see it once more, my light, for me, just once before I die!' (296). Nor is it the case, Rebekah insists, that she cannot imagine unmediated, instinctual desire: she 'can understand... a wave of black, primitive bestial desire surging up at some moment in life in a nature otherwise pure and lofty' (287). But to be dominated by such desire is to be blighted: it would be like a land 'that always trembled, that

was never still, when from every smallest crack the foetid fume rose, and a fine, almost imperceptible, fall of ashes covered it: the very dogs would leave it – no man would live there!’ (288) In other words, there *is* something automaton-like about sexuality – the demands of the species depend on it. But for human beings sociality is their condition, it is the fabric of the environment in which they exist and evolve – there must be an expansive affective life for there to be human and social flourishing. Human evolution, Rebekah insists, is ‘love and the expansion of ego to others’ (209). Nor could this, for Schreiner, ever be answered by the fantasy of making sexual selection rational, or the simplifications of imagining replacing romantic or passionate love with love for the race.⁷⁰

The restitution or crafting of Rebekah’s agency must be done by folding back into her account of the world elements of the evolutionary script she also criticises and rejects. It is this capacity for working and reworking, for creating resisting spaces within the new biological and psychological languages, which Schreiner and Eliot share. Nevertheless, and as I suggested towards the beginning of this paper, the imaginative repertoire made available for women writers by nineteenth-century science surely narrows towards the century’s end. One consequence is that the realist novel also falters: Schreiner could not finish *From Man to Man*, turning instead to the more compressed and symbolic forms she called ‘dreams’, or to allegories and short stories. The novel had to await the transforming energies of literary modernism and the new, often stranger, science of the twentieth century. What has persisted, and still does, is the peculiarly heavy burden for women of biological determinism.

As I have been emphasising, however, that burden was sometimes dislodged by what Levine calls the ‘fertile and disruptive’ potential of Darwin’s theories.⁷¹ I end with a quote that illustrates the way in which evolutionary discourse could indeed be put to emancipatory purposes. It represents an upbeat and celebratory wresting of sexual pleasure and creativity from the bleaker, more restricted, indeed trivial, script that sexual selection and scientific naturalism indubitably created. It is from the introduction to Schreiner’s 1911 tract, *Woman and Labour*, where Schreiner imagines human sexuality extending beyond the brute physical fact of reproduction. The image she uses evokes an expansiveness and abundance that remains utterly Darwinian and evolutionary. We might allow it to remind us of Darwin in 1838, after a visit to

the famous Loddiges nursery in London, enthusing about its roses: ‘Saw in Loddiges garden 1279 varieties of roses!!! Proof of capability of variation.’ Like the good non-reductive thinker he so often was, Darwin knew that environments and contexts matter. In his Notebook, he immediately asks if these many varieties of rose are seeded, nurtured and grown in the same soil and the same atmosphere. The biological facts of rose variation or of human sexuality are meaningful only in terms of their environment, how they are treated, and the relations they have with others.⁷²

In the last pages of the book, I tried to express what seems to me a most profound truth often overlooked: - that as humanity and human societies pass on slowly from their present barbarous and semi-savage condition in matters of sex into a higher, it will be found increasingly, that over and above its function in producing and sending onward the physical stream of life (a function which humanity shares with the most lowly animal and vegetable forms of life, and which even by some noted thinkers of the present day seems to be regarded as its only possible function,) that sex and the sexual relation between man and woman have distinct aesthetic, intellectual, and spiritual functions and ends, apart entirely from physical reproduction. That noble as is the function of the physical reproduction of humanity by the union of man and woman, rightly viewed, that union has in it latent, other, and even higher forms, of creative energy and life-dispensing power, and that its history on earth has only begun. As the first wild rose when it hung from its stem with its centre of stamens and pistils and its single whorl of pale petals, had only begun its course, and was destined, as the ages passed, to develop stamen upon stamen and petal upon petal, till it assumed a hundred forms of joy and beauty.⁷³

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² I use ‘sexual selection’ here imprecisely, of course, to refer to the novel’s insatiable interest in the processes of courtship, love and marriage.

- ³ See Helen Cronin, *The Ant and the Peacock: Altruism and Sexual Selection from Darwin to Today* (Cambridge: Cambridge University Press, 1991). Mivart is quoted 172. Darwin famously sees humans as ‘exceptional’ in relation to sexual selection: unlike the rest of the creaturely world it is men who are sexual choosers, rather than women. But the dominance of female sexual selectors in the *Descent* allowed women writers to take up, challenge and rework the concept of female choice. For a concise discussion, see Angelique Richardson, *Love and Eugenics in the Late Nineteenth Century: Rational Reproduction and the New Woman* (Oxford: Oxford University Press, 2003), 55-6.
- ⁴ ‘In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation.’ Charles Darwin, *The Origin of Species by Means of Natural Selection* [1859] (Harmondsworth: Penguin, 1982), 458.
- ⁵ For full discussion of the secularizing context of the emotions, see Thomas Dixon, *From Passions to Emotions: The Creation of a Secular Psychological Category* (Cambridge: Cambridge University Press, 2003).
- ⁶ Quoted in Rick Rylance, *Victorian Psychology and British Culture 1850-1880* (Oxford: Oxford University Press, 2000), 73.
- ⁷ James Ward, *Naturalism and Agnosticism* 1, quoted in Frank Miller Turner, *Between Science and Religion: the Reaction to Scientific Naturalism in Late Victorian England* (New Haven and London: Yale UP, 1974), 15.
- ⁸ Thomas H. Huxley, ‘On the Hypothesis that Animals are Automata, and its History’ [1874], *Methods and Results* (London: Macmillan, 1904), 199-25 (239).
- ⁹ Quoted in Gavin de Beer (ed.), Charles Darwin and Thomas Henry Huxley, *Autobiographies* (Oxford: Oxford University Press, 1983), xv.
- ¹⁰ Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* [1871] (Harmondsworth: Penguin, 2004), 622, 629. Further page references are given in the text.
- ¹¹ For contemporary account asserting that evolution in fact indicates female superiority see Eliza Gamble, *The Evolution of Woman: an Inquiry into the Dogma of her Inferiority to Man* (New York: GP Putnam’s Sons, 1894). For more recent critical feminist assessment of the *Descent*, see Evelleen Richards, ‘Darwin and the Descent of Woman’, in David Oldroyd and Ian Langham (eds), *The Wider Domain of Evolutionary Thought* (London: Reidel, 1983), 57-111 and Rosemary Jann, ‘Darwin and the Anthropologists: Sexual Selection and its Discontents’, *Victorian Studies*, 37 (1994), 286-306.
- ¹² George Levine, *Darwin Loves You: Natural Selection and the Re-enchantment of the World* (Princeton and Oxford: Princeton University Press, 2006), 169-201.
- ¹³ See Gillian Beer, ‘Translation or Transformation? The Relations of Literature and Science’, in *Open Fields: Science in Cultural Encounter* (Oxford: Oxford University Press, 1996), 173-95.
- ¹⁴ Ruth Bernard Yeazell, *Fictions of Modesty: Women and Courtship in the English Novel* (Chicago and London: University of Chicago Press, 1991), xi.
- ¹⁵ James Moore and Adrian Desmond, ‘Introduction’, in Darwin, *Descent*, lvi.
- ¹⁶ The key discussion of eugenic feminism and New Woman novels is Richardson’s *Love and Eugenics*.
- ¹⁷ She deemed the book ‘ill-written and sadly wanting in illustrative facts’: George Eliot, letter to Charles Bray, 25 November 1859, in Gordon S. Haight (ed), *The George Eliot Letters*, vol. III 1859-1861 (Oxford: Oxford University Press, 1954), 214.
- ¹⁸ Richardson, *Love and Eugenics*, 85; George Eliot, *The Mill on the Floss* [1860] (Harmondsworth: Penguin, 2003), 22 (further page references will be given in the text). Darwin develops the concept of pangenesis to account for hereditary transmission in his 1868 *Variation of Plants and Animals under Domestication*. In the *Descent*, he tentatively suggests that variations arising later in life are commonly transmitted to the same sex, while early ones are transmitted to both. For discussion, see Jim Endersby, ‘Darwin on Generation, Pangenesis and Sexual Selection’, in Jonathan Hodge and Gregory Radick (eds), *The Cambridge Companion to Darwin* (Cambridge: Cambridge University Press, 2003), 69-91.
- ¹⁹ For cogent discussion of early- and mid-Victorian ideas about heredity, and their relation to later eugenics, see John C. Waller, ‘Ideas of Heredity, Reproduction and Eugenics in Britain, 1800-1875’, in *Studies in History and Philosophy of Biological and Biomedical Sciences* 32C, 3 (Sept. 2001), 457-89.
- ²⁰ George Henry Lewes, ‘Hereditary Influence, Animal and Human, *Westminster Review* NS, 10 (1856), 135-162, 136. Lewes reworked this material in Chapter 12 of his *The Physiology of Common Life*, vol. II (Edinburgh and London: William Blackwood, 1860), 375-411.
- ²¹ Alexander Walker, *Intermarriage* (London: John Constable, 1838), xvii. Darwin makes reference to *Intermarriage* in both the *Descent* (fn.25, 51), and in his Notebooks. See for example, Sir Gavin de Beer (ed.), ‘Darwin’s Notebooks on Transmutation of Species. Part IV, Fourth Notebook’, Oct. 1838- July 1839, *The Complete*

Works of Charles Darwin Online, 118. Accessed at <http://darwin-online.org.uk/content/frameset?itemID=F1574d&viewtype=text&pageseq=1> on 15/09/08.

²² Walker, *Intermarriage*, 150, 123.

²³ Thomas J. Graham, *On the Management and Disorders of Infancy and Childhood* (London: Simpkin, Marshall & Co., 1853), 28.

²⁴ Graham, *Management and Disorders*, 51. This passage quotes Walker almost verbatim.

²⁵ Graham, *Management and Disorders*, 50.

²⁶ Francis Galton, *Inquiries into Human Faculty and its Development* (London: Macmillan, 1883), 25.

²⁷ Waller, 'Ideas of Heredity, Reproduction and Eugenics', 463-8.

²⁸ On Darwin's decision to marry, see Richards, 'Darwin and the Descent of Woman', 79-87.

²⁹ For wider discussion of Spencer's 'The Origin and Function of Music', see Delia de Sousa Cornea, *George Eliot, Music and Victorian Culture* (Basingstoke: Palgrave, 2003).

³⁰ Dinah Birch points to the way Maggie is persistently associated with animals in the text: see Dinah Birch, 'Introduction', George Eliot, *The Mill on the Floss* (Oxford: Oxford University Press, 1996), vii-xxx. On Darwin's commitments to social morality, see Robert J Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (Chicago and London: University of Chicago Press, 2002), 540-52.

³¹ See Rylance, *Victorian Psychology*, 73-4.

³² For a sense of the range of psychological writing in the period dealing with issues of will, volition and the unconscious mind, see Jenny Bourne Taylor and Sally Shuttleworth (eds), *Embodied Selves: An Anthology of Psychological Texts 1830-1890* (Oxford: Clarendon, 1998), especially 67-101.

³³ See Dixon, *Passions to Emotions*, 149-50; de Sousa Cornea, *George Eliot, Music and Victorian Culture*, 107-8.

³⁴ Gillian Beer, 'Beyond Determinism: George Eliot and Virginia Woolf', in *Arguing with the Past: Essays in Narrative from Woolf to Sidney* (London and New York: Routledge, 1998), 117-37 (126).

³⁵ I am thinking here of the way in which Tom's education is represented as a form of forced rote-learning, whereas Maggie's lively and appetitive relation to education is given little nourishment. As Mill's essay contends, it is convention, rather than ability, that determines such differences and wastes human potential. See John Stuart Mill, *The Subjection of Women* [1869] (London and Melbourne: Dent, 1986).

³⁶ George Simpson to Joseph Munt Langford, 3 November 1859, discussing Blackwood's offer for serial publication of *Mill*, in Haight, *George Eliot Letters*, 194.

³⁷ George Eliot to John Blackwood, 30 November 1859, in Haight, *George Eliot Letters*, 219.

³⁸ Havelock Ellis, 'Notes on Olive Schreiner' [1884], in Cherry Clayton (ed.), *Olive Schreiner* (Johannesburg: McGraw-Hill, 1983), 40-1. Schreiner was reacting to the scene late in the novel, when Lucy visits Maggie.

³⁹ Haight, *George Eliot*, 18.

⁴⁰ See Boyd Hilton, *The Age of Atonement: The Influence of Evangelicalism on Social and Economic Thought 1785-1865* (Oxford: Clarendon Press, 1986), 13.

⁴¹ See Haight, *George Eliot*, 22-4.

⁴² De Sousa Cornea, *George Eliot, Music and Victorian Culture*, 106, 114, 128, 120.

⁴³ All quotes from A.S. Byatt, 'The "Placing" of Stephen Guest', appendix to *Mill on the Floss*, 545-9.

⁴⁴ Quoted in A. S. Byatt, 'Introduction', Eliot, *Mill on the Floss*, xxxvi.

⁴⁵ George Eliot to Barbara Bodichon, 5 December 1859, in Haight, *George Eliot Letters*, 227.

⁴⁶ Henry Sidgwick, *The Methods of Ethics* (1874), quoted in Harro Maas, 'Jevons, Mill and the Private Laboratory of the Mind', *The Manchester School*, 73, 5 (2005), 629.

⁴⁷ Huxley, 'Automata', 243-4.

⁴⁸ See the extract from *Principles of Mental Physiology* included in Taylor and Shuttleworth, *Embodied Selves*, 95-101.

⁴⁹ William James, *Principles of Psychology* (New York: Henry Holt and Co., 1890), 137, 144.

⁵⁰ See Rylance, *Victorian Psychology*, 93.

⁵¹ Rev. Professor Watts, 'On the Hypothesis that Animals are Automata: A Reply to Professor Huxley's Address before the British Association, at the late meeting in Belfast', from *Problems of Faith: a Contribution to Present Controversies* (London: Hodder & Stoughton, 1875), 60.

⁵² Huxley, 'Automata', 246.

⁵³ Wesley and Arnold, quoted in Christopher Herbert, *Culture and Anomie: Ethnographic Imagination in the Nineteenth Century* (Chicago and London: University of Chicago Press, 1991), 39, 41.

⁵⁴ Herbert, *Culture and Anomie*, 72. Herbert sees the construction of an alternative to this doctrine of desire and control as the crucial project of progressive social theory: 'However, Wesleyan-style thinking on this score was

invested with so much affective and imaginative power and, in particular, so much moral urgency, that it could hardly be purged altogether' (300).

⁵⁵ Adrian Desmond, *Huxley: Evolution's High Priest* (London: Michael Joseph, 1997), xiii.

⁵⁶ Olive Schreiner to Havelock Ellis, 20 November 1884, S.C. Cronwright-Schreiner (ed), *The Letters of Olive Schreiner 1876-1920* (London: T. Fisher Unwin, 1924), 46.

⁵⁷ Havelock Ellis to Olive Schreiner, 8 December 1884, Yaffa Claire Draznin (ed), *My Other Self: The Letters of Olive Schreiner and Havelock Ellis, 1884-1920* (New York: Peter Lang, 1992), 250.

⁵⁸ Olive Schreiner, *Undine* (London: Benn, 1929). This version published by Kessinger Publishing's Rare Reprints (undated), 17. Further page references are given in the text.

⁵⁹ He also authored one of the most famous of American sermons, 'Sinners in the Hands of an Angry God' (1741), which reputedly had congregations groaning in terror at the scale of God's punishments for human wickedness.

⁶⁰ Norman Fiering, *Jonathan Edwards' Moral Thought and its British Context* (Chapel Hill: University of North Carolina Press, 1981), 292.

⁶¹ See John E. Smith, Harry S. Stout and Kenneth P. Minkema (eds), 'Introduction', *A Jonathan Edwards Reader* (New Haven and London: Yale University Press, 1995), xxvi.

⁶² Huxley, 'Automata', 244.

⁶³ I consulted Edwards' text online, at www.jonathanedwards.com. Undine reads points 8, 9 and 10 of section II, part III. In point 9, Edwards writes: 'If the *Logos*, who was with the Father before the world, and who made the world, thus engaged in covenant to do the will of the Father, in the human nature, and the promise was as it were recorded, that it might be made sure, doubtless it was *impossible* that it should fail. And so, it was impossible that Christ should fail of doing the will of the Father in the human nature.'

⁶⁴ The Diamond Fields were at Kimberley, situated in the territory of Griqualand West, the control of which was disputed between Britain and the Orange Free State: diamonds were discovered there in 1867.

⁶⁵ For some examples of this tendency in *Punch*, see Angelique Richardson and Chris Willis, 'Introduction', in Angelique Richardson and Chris Willis (eds), *The New Woman in Fiction and in Fact: Fin-de-Siècle Feminisms* (Basingstoke: Palgrave, 2001), 1-38 (14-16).

⁶⁶ Elaine Showalter famously condemned the feminist fiction of this period for its inward-looking and restrictive vision. See *A Literature of Their Own: British Women Novelists from Bronte to Lessing* (London: Virago, 1977), 182-215.

⁶⁷ See Richardson, *Love and Eugenics*, for discussion of the importance of eugenic ideas in both feminist fiction and in wider debate about the changing role of women in the period.

⁶⁸ Olive Schreiner, *From Man to Man* [1926] (London: Virago, 1982). Page references are given in the text.

⁶⁹ See *Descent*, 689 and *From Man to Man*, 210-11.

⁷⁰ One of George Egerton's most famous short stories explores this issue in a rather different manner. In 'A Cross Line', the female protagonist relinquishes her would-be lover, despite her sense that he might meet her intellectual and spiritual needs. Instead, she accepts the physical and earthy love of her prosaic husband on discovering that she is pregnant with his child. Maternal identity here overrides intellectual expansion. George Egerton, 'A Cross Line' [1893], in *Keynotes and Discords* (London: Virago, 1983), 1-36.

⁷¹ I quote Levine above, on p. 3.

⁷² Sir Gavin de Beer (ed.), 'Darwin's Notebooks on Transmutation of Species. Part III. Third Notebook', 1838, *The Complete Works of Charles Darwin Online*, 119-50 (142). Accessed at <http://darwin-online.org.uk/content/frameset?itemID=F1574c&viewtype=text&pageseq=1> on 26/08/08.

⁷³ Olive Schreiner, *Woman and Labour* [1911] (London: Virago, 1978), 26-7.